

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/15749

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G01N 27/00, 27/44; C23F 1/02

US CL : 257/253; 73/31.05; 205/786.5

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/253; 73/31.05; 205/786.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
|------------|---|------------------------|
| X          | US 4,514,263 A (JANATA et al) 30 April 1985 (30.04.1985), Figure 1, column 5, column 7 lines 64+.                             | 1-5,7,9,11-13,15,18,19 |
| ---        |   | -----                  |
| Y          |   | 6,10,14                |
| X          | US 6,298,710 B1 (SAMMAN et al) 09 October 2001 (09.10.2001), abstract, Figure 1, column 3.                                    | 1,3,7-9,12,16-19       |
| X          | US 4,671,852 A (PYKE) 09 June 1987 (09.06.1987), Figure 1E, column 5 line 38 through column 6 line 7.                         | 1-3,7,9,11,12,15,18,19 |
| Y          | US 6,290,838 B1 (MIFSUD et al) 18 September 2001 (18.09.2001), column 1 lines 13-24.  | 14                     |
| Y          | US 6,503,831 B2 (SPEAKMAN) 07 January 2003 (07.01.2003), column 7, lines 22-40.   | 6,10                   |
| A          | US 2002/0017126 A1 (DIMEO, JR. et al) 14 February 2002 (14.02.2002), page 12, paragraph 171                                   | 6,10                   |
| A          | US 5,372,785 A (JOHNSON et al) 13 December 1994 (13.12.1994), see abstract and Figures 2-3.                                   | 1,9                    |
| Y          | US 5,716,506 A (MACLAY et al) 10 February 1998 (10.02.1998), column 5 lines 1-11, column 5 lines 32-43, column 14 lines 5-23. | 6,10                   |

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

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document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

20 August 2003 (20.08.2003)

Date of mailing of the international search report

05 NOV 2003

Name and mailing address of the ISA/US

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| A          | US 4,996,073 A (COPELAND et al) 26 February 1991 (26.02.1991), column 4, lines 7-48. | 6,10,14               |